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CLINICALEVIDENCE
Peer-reviewed Case Report

Chiropractic Applied Kinesiology methods for cervical herniated disc syndrome along with sciatica and bilateral frozen shoulder: A case report

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Objective: To present a single case study of a 52-year-old Filipino female with severe pain in her lower lumbar region, left hip, and radicular pain down her left leg. Additionally, bilateral 'frozen shoulders' were present, with radiculopathy down both arms to the wrists. To present an overview of the muscular impairments found during manual muscle testing (MMT) evaluation that guided the interventions offered.

Clinical Features: The low back muscular dysfunction was exacerbated by both movements in the cervical spine and dysfunctions in the feet, which had been present for over 5 years. The patient had undergone spinal laminectomy surgery at the L5-S1 level 5 years previously.

Intervention and Outcome: Chiropractic evaluation and treatment, and in particular applied kinesiology (AK)-guided chiropractic and nutritional evaluation and treatment, were used for treatment of the numerous factors causing the symptoms. Following spinal and nutritional chiropractic treatment, the patient showed significant improvement in her leg and foot pain, was able to bear weight without pain, and had full restoration of ROM and comfort in the use of her arms. The patient has remained symptom free for 5 months since her first 5 treatments.

Conclusion: The MMT procedures used in this patient's care offered useful information directly linking the assessment procedure to the treatment method that resolved her chronic musculoskeletal dysfunction and pain and corrected her debilitating upper and lower body symptoms.

Indexing Terms: Chiropractic; subluxation; bilateral frozen shoulder; sciatica; upper cervical; herniated disc syndrome.

Introduction

According to a growing number of studies, patients with low-back pain have lower mean trunk strength than asymptomatic subjects. (1, 2) Patients with neck and shoulder pain also show muscular inhibition in many systematic reviews. (3) Because motor dysfunction, and specifically muscular inhibition, has been found as a common comorbidity associated with sciatica, plantar fasciitis, and cervical radiculopathy, a reliable clinical tool for the

'... within this complex patient presentation upper cervical segments were identified for adjustment using manual muscle testing and other standard AK testing procedures. Resolution of pain and dysfunction was rapid and is ongoing'

diagnosis of this muscular inhibition is desirable. (2) Poor motor performance is most practically assessed in the clinic using the manual muscle test (MMT). (3 - 14)

Applied kinesiology (AK) evaluates muscle function using the MMT, a diagnostic test that has shown good reliability and validity for patients with muscle strength impairments. (2, 3) The use of MMT procedures is for three purposes in AK:

i. to aid in the diagnoses of structural, chemical, and/or mental aspects of health dysfunctions
ii. to offer the potential for shortening the course of treatments through 'challenge' procedures, and
iii. to determine the effectiveness of treatments.

In so doing, AK's testing methods used for the discovery of structural, chemical, or biopsychosocial disorders that produce these muscle strength impairments guide the treatment given to the patient. (2 - 5; 10, 11)

In AK, muscular dysfunction is thought to reflect neural function. First the Kendalls in the 1950s, (2, 12) then Goodheart in the 1960-1990s, (13) followed by many others have expanded the construct validity and the clinical usefulness of the MMT, (2 - 20) because of the recognition that muscular imbalance is a key characteristic of spinal and joint dysfunction.

> AK suggests that muscle function is a transcript of the central integrative state of the anterior horn motoneurons, summing all excitatory and inhibitory inputs. (11) In other words, the locus of muscular dysfunction ultimately rests within the nervous system.

AK is a diagnostic and therapeutic chiropractic technique that has gained peer-reviewed published support within the chiropractic, medical, osteopathic, dental, biofeedback, acupuncture, veterinary, and other health care literature. (15 - 20) The research underlying the AK manual muscle testing procedures as this relates to the treatment of foot, pelvic, sacroiliac, sciatic and shoulder pain has some substantiation as well. (2)

Clinical features

The patient was an active 52-year-old female, 157.5cm (5'2"), who complained of pain in the left hip, buttock, groin, lateral leg, calf and ankle that had been present for 5 months. The patient also had painful plantar fasciitis and frozen shoulders (abduction and flexion and extension of the shoulders limited to 20°) for at least 3 years previously.

The patient had undergone physical therapy and chiropractic treatments for several months and at different times over the previous 5 years, but found that for the past 4 months walking or sitting for too long exacerbated her pain unbearably. In fact, on each of her visits previous to seeing the author, the patient was not able to get off the chiropractic or physiotherapeutic table without intense pain. She previously enjoyed playing badminton with her husband several times a week, and was active at home with her children, grandchildren, and in the kitchen cooking for her family. All of these activities were eliminated from her life with the condition she sought

treatment for. The patient was overweight and de-conditioned. She did not take any supplements and was a non-smoker.

Dananberg has shown that symptoms associated with foot dysfunction include tibialis posterior dysfunction, anterior knee pain and low back pain. (21) The patient's medical doctor had diagnosed foot drop on her left side 3 months before examination at our clinic, and a surgical consultation was advised. Anxiety about the surgical approach brought her to our Chiropractic clinic for evaluation. The patient complained of pain in both feet that was constant, but the foot pain was worse with walking as was her back pain.

The patient rated the pain as a 10 on the numerical analog scale, and when asked how many days a week she had the back, hip, leg and foot pain, the patient replied '*7 days out of the week*'.

A battery of relevant orthopaedic and neurologic tests was conducted together with an examination for signs for the low back, pelvis, sciatic nerve, shoulder, neck and cranial nerves. These tests and signs were positive in the identical locations where pain was reported and muscle impairments were later found. (Table 1) The positive orthopaedic tests included Trendelenburg's, Kemp's, FABERE Patrick's, Hibb's, with pain on palpation of the left dorsal sacro-iliac and sacrotuberous ligaments, lower lumbar facets, sacro-sciatic notch, and plantar fascia. Functional hallux limitus (FHL) was present in both feet (most markedly on the left). In the upper body, the cervical compression and Kabat compression tests were positive. Apley's scratch, A-C crossover, A-C Compression, and Hawkin's Impingement tests were all positive bilaterally.

AK examination

The purpose of specific muscle tests in the examination was to determine if there were objective musculoskeletal impairments that could substantiate the patient's continuing subjective complaints.

Positive findings on MMT were used to guide the appropriate interventions that would take the patient from muscle weakness toward strength. If positive MMTs were found, then the examination design continued to determine the cause of the dysfunction and whether it could be improved. To accomplish this, various sensory receptor stimuli (challenge and therapy localisation [TL]) were applied to determine if the muscle dysfunction was alleviated, indicating that the weakness was functional in nature and had potential for improvement.

The muscle tests listed in this examination as inhibited (Table 1) were equivalent to 4 or less on the 5-point strength scale provided in the *Guides to the Evaluation of Permanent Impairment, 6th Edition*, by the *American Medical Association*. (14) Muscles graded 4 or less were considered weakened, warranting interventions as described below.

Fig. 1

Fig. 2

Table 1: AK assessment and treatment sequence

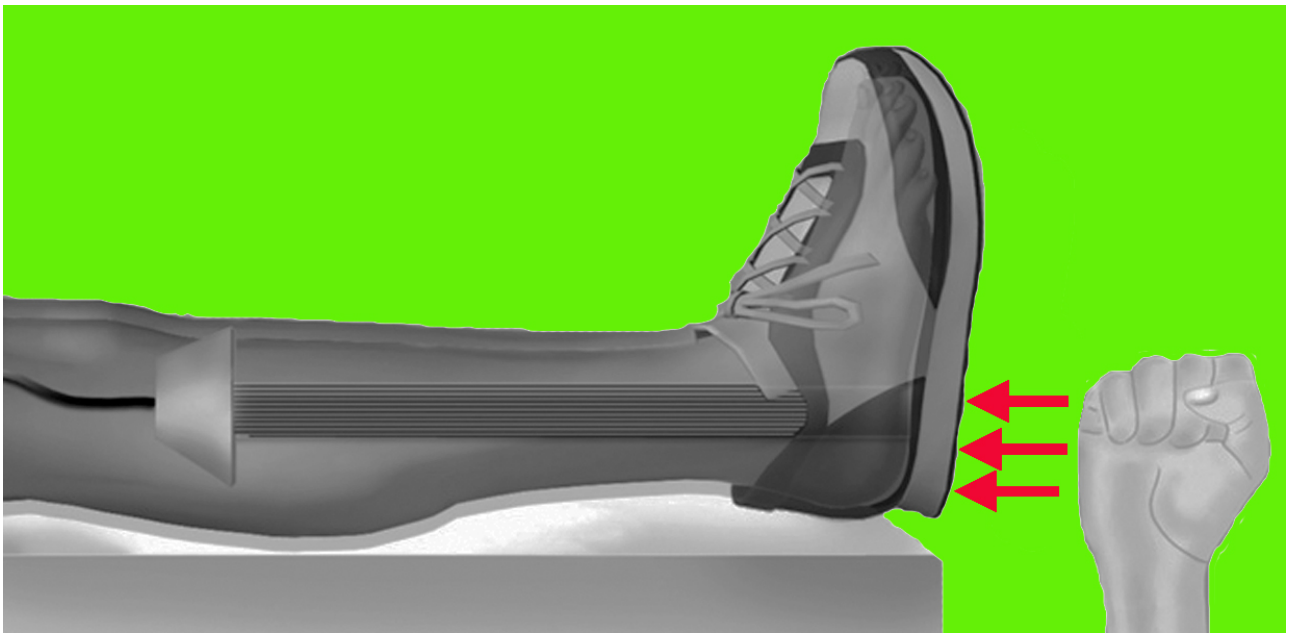
AK examination finding	Corrective Treatment/Outcome
• Bilaterally inhibited psoas and gluteus maximus muscles	• Occipital fixation SMT (strengthened psoas and gluteus maximus muscles bilaterally) (2, 24)
• Sternocleidomastoid bilaterally and left upper trapezius muscles inhibited	• Right inspiration, left expiration assist cranial dysfunction corrections to the temporal bones bilaterally strengthened SCM muscles bilaterally and left upper trapezius
• Serratus anticus, subscapularis, anterior-middle-posterior deltoid, teres minor inhibited	• Cervical herniated disc correction and approximation correction of A-C joint bilaterally (followed by Kinesiotape application) strengthened shoulder muscles and improved ROM immediately.
• Rectus femoris muscles inhibited bilaterally after cervical compression and Kabat challenge to the neck (Figures 1 & 2)	• Cervical disc CMT employed, and Superoxide Dismutase was suggested and subsequently purchased by the patient on-line
• Gluteus maximus muscles inhibited bilaterally	• SMT for an upper cervical fixation (strengthened the gluteus maximus bilaterally) (2, 24)
• Positive challenges for a category II and category III pelvis with a right posterior ilium	• SMT pelvis (DeJarnette wedges, including prone using high-velocity, low-amplitude manipulations with a drop-table) abolished challenge to the pelvis and lumbar spine and strengthened the adductor and hamstring muscles bilaterally (2, 24)
• Positive challenge to the foot (shock absorber test) weakened previously strong indicator muscles.[12, 24, 27] Flexor and extensor hallucis and posterior tibialis muscles inhibited on the right foot	• Manipulation to articulations of the right foot (guided by AK challenge methods) abolished the shock absorber test and strengthened the extensor and flexor hallucis and posterior tibialis muscles on the right foot. This also corrected FHL bilaterally.

Additional findings related to the MMT were that the sternocleidomastoid bilaterally and the upper trapezius muscle on the left strengthened with forced expiration held. This test has been described in the literature. (22, 23, 24, 25)

Helbing's sign (indicative of foot pronation) was present in both feet, as was the AK shock absorber test (SAT). (Figure 3) The SAT involves striking the foot in various directions and then

assessing changes in muscle strength. The SAT has been found to be a reliable tool for the discovery of subluxations of the foot that create muscle weaknesses in the proximal leg muscles. (2, 25)

Fig 3: AK 'shock absorber' test



Intervention and outcome

In AK, once the dysfunctional muscle has been identified, several treatment options are open to the doctor. The one that is most effective in restoring strength to the inhibited muscle (using the challenge and TL procedures) indicates the best treatment for the patient. (2, 24)

Challenge is a diagnostic procedure unique to AK that is used to determine the body's ability to cope with external stimuli, which can be physical, chemical, or mental. TL is another diagnostic procedure unique to AK that consists of placing the patient's hand over areas of suspected involvement and observing a change in the MMT.

Treatment began with an attempt to correct the causes of the muscular and deficits found throughout the body on examination. (See Table 1)

Upper cervical corrections (guided by AK challenge methods) were performed and returned strength to the inhibited *psoas* and *gluteal* muscles.

Fig 4: *Psoas muscle* manual muscle test

Fig 5: *Gluteus maximus muscle* manual muscle test

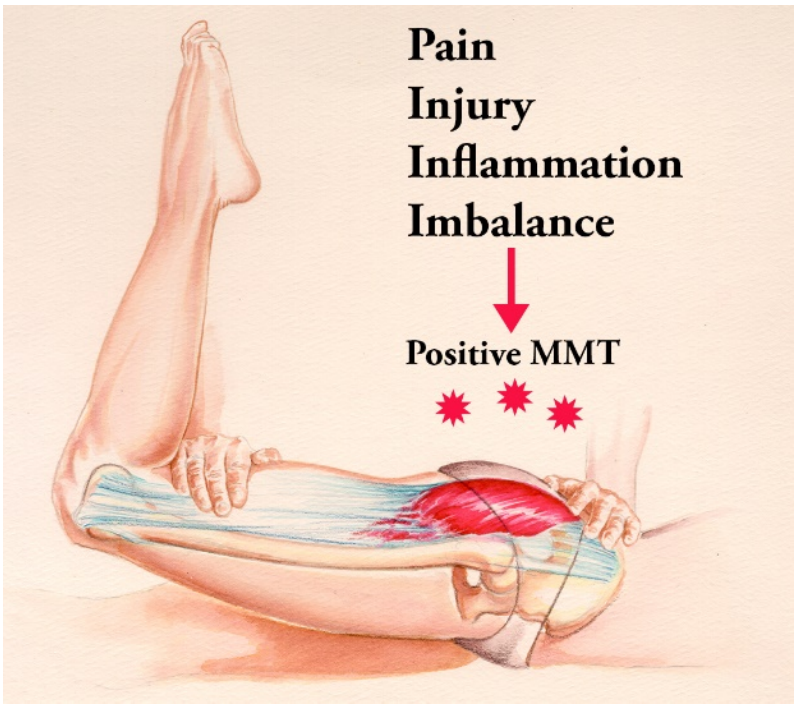
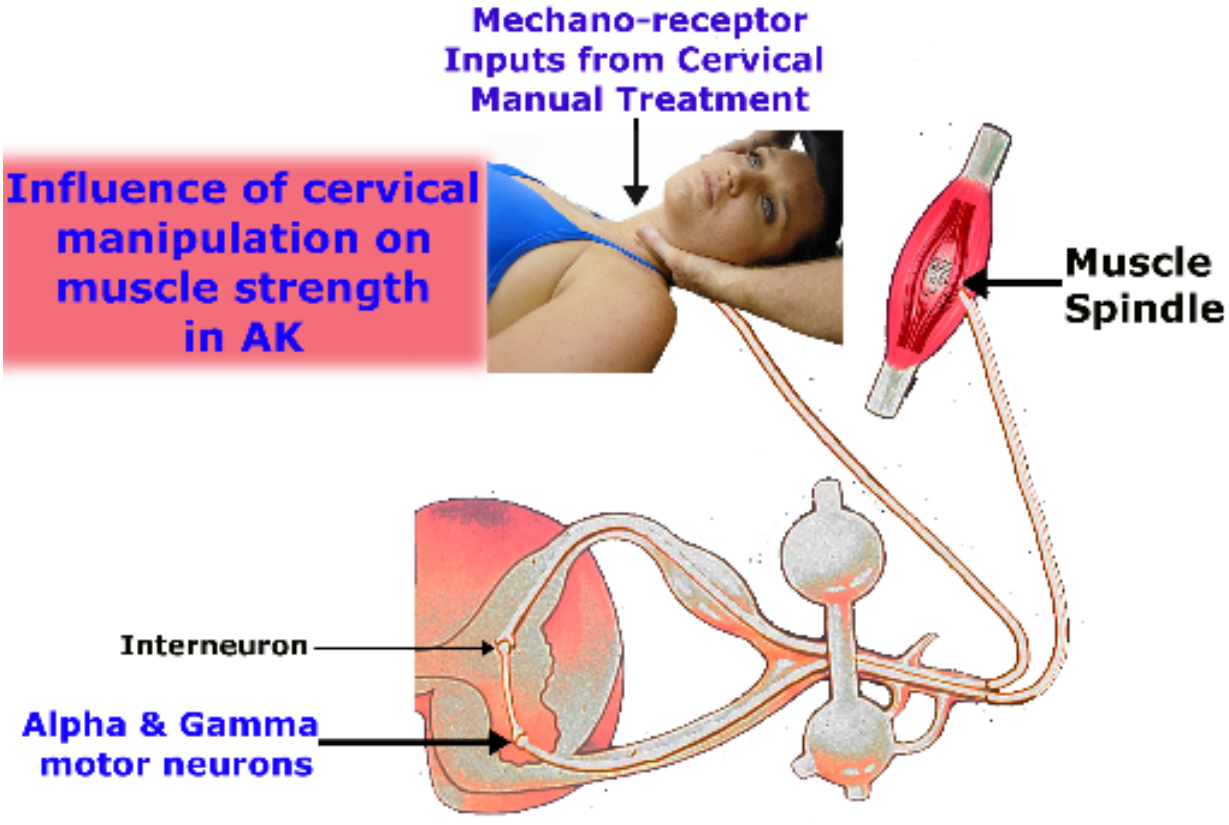


Fig 6: Upper cervical SMT correction strengthened the *psoas* and *gluteus maximus* muscles bilaterally



Treatment of the foot was likewise accomplished with HVLA manipulations and abolished the muscle weaknesses in the legs resulting from the SAT and all subsequent directions of challenge to the foot. This also corrected the *functional hallux limitus* (FHL) that was present in both feet.

FHL involves limitation in dorsiflexion of the 1st metatarsal-phalangeal joint during walking, despite normal function of this joint when non-weight bearing. (2, 21, 24) Dananberg and others have shown FHL to be a remote, often hidden source of postural degeneration and low back pain. (21)

After these procedures, provocative challenges and orthopaedic tests were repeated at the sacro-iliac, lumbar, and ankle-foot articulations and were negative. This suggested that the causative factors for a portion of the low back, pelvic, and foot dysfunctions had been found and corrected.

After her first treatment session of 20 minutes, the patient reported that her comfort on moving and sitting was improved. For the first time in months, she was able to step off the examination table without significant pain. Over the next 3 weeks (4 visits, 15-minutes each, once/week), the low back, leg and foot pain remained at the VAS level of 1. After 5 visits (covering a 4-week period), all of the patient's symptomatology was resolved, save for a residual slight stiffness due to her age and comorbidities. The correction of her A-C joint pains (assisted by Kinesiotape) eliminated the severe ROM deficits in her arms bilaterally; in addition, her cervical herniated disc symptoms and ROM in her neck were all improved to near pre-injury status.

Follow-up 5 months later showed no return of the patient's leg and foot and low back, neck, arm and shoulder problems (she returned to her normal regimen of cooking extensively, playing with her family and husband, and cooking for hours every day), since her first series of 5 initial Chiropractic treatments.

Discussion

In AK, the assessment of specific localised muscular dysfunctions linked the assessment procedure to a range of treatment options. The muscular inhibitions found with the MMT were given specific physical challenges that improved the patient's muscular strength; these challenges then guided the manipulative treatment applied and normalised tissue tensions on follow-up MMT.

Most importantly, this case report demonstrates the continued ineffectiveness and overuse of spine surgery. More people need to understand the risks and costs before embarking on a path to potential failed back surgery. People also need to know there is a better solution, chiropractic care, that is getting the recognition it has long deserved. Around the world there are millions people who are now addicted to strong medications for their chronic back pain from failed back surgeries.

The editors of TheBACKLETTER®, a newsletter from the *Department of Orthopedic Surgery* at *Georgetown Medical Center* in Washington, DC, agree with this frustration with the medical approach:

> 'The world of spinal medicine, unfortunately, is producing patients with failed back surgery syndrome at an alarming rate…There is growing frustration over the lack of progress in the surgical treatment of degenerative disc disease. Despite a steady stream of technological innovations over the past 15 years, from pedical screws to fusion cages to artificial discs, there is little evidence that patient outcomes have improved. Many would like to see an entirely new research effort in this area, to see whether degenerative disc disease and/or discogenic pain are actually diagnosable and treatable conditions'. (26)

In this case, muscular impairments associated with this patient's pain appeared to be an accurate measurement of the distress the patient was under. Treatment for these factors eliminated the patient's pain and restored her postural and muscular balance.

Limitations

As in any case study, the natural resolution of symptoms in the patient cannot be ruled out. The possibility of this occurrence is diminished, however, by the rapid and sustained disappearance of symptoms within days of treatment, whereas the sciatic neuralgia had persisted for 5 years since her failed laminectomy surgery, and the neck, shoulder and arm pains for 3 years, prior to the interventions described in this report.

Conclusion

After 5 years of low back and radicular pain and 3 years of arm and shoulder pains, the patient recovered rapidly once the specific causes of her aberrant neuromuscular functioning were identified and corrected. The tool used that helped match the treatment for this patient's complex lumbopelvic, foot, neck and shoulder dysfunction was MMT, which in 'Chiropractic AK' is always used in conjunction with other methods of diagnosis including standard orthopaedic, neurologic, laboratory and physical examinations as demonstrated in this case report.

The patient has remained free of symptoms in these areas of difficulty for 2 years since her initial treatments.

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